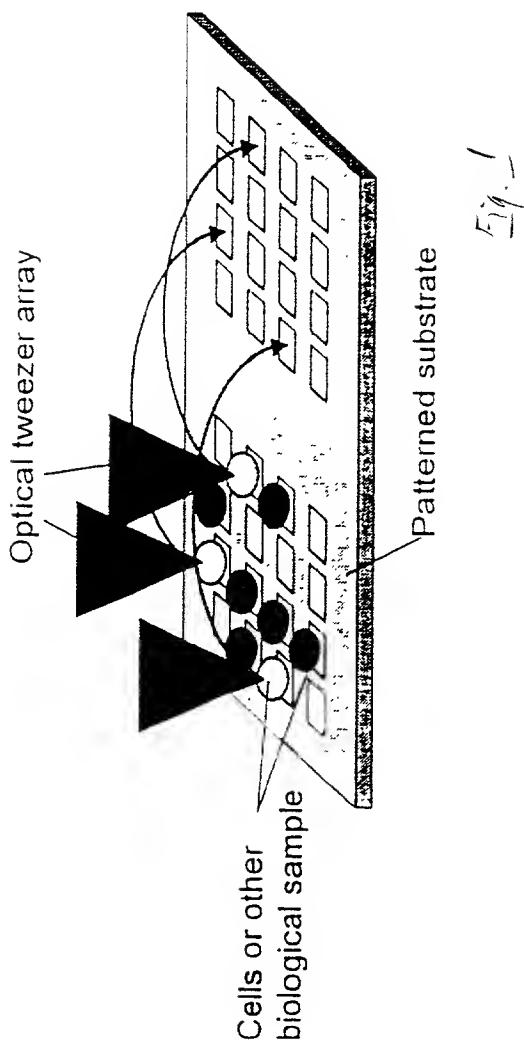


Hermite-Gaussian  
mode VCSEL:

$$E_{1q} \cdot z^4$$

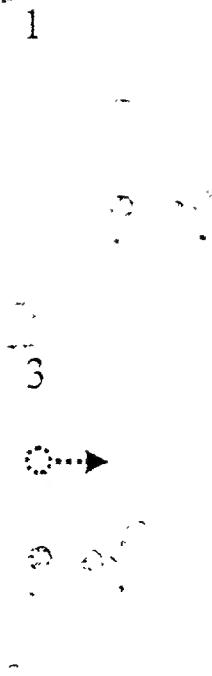
Laguerre-Gaussian  
mode VCSEL:

$$E_{2q} \cdot z^4$$



(2)

Fig. 3a 1



2



Fig. 3b

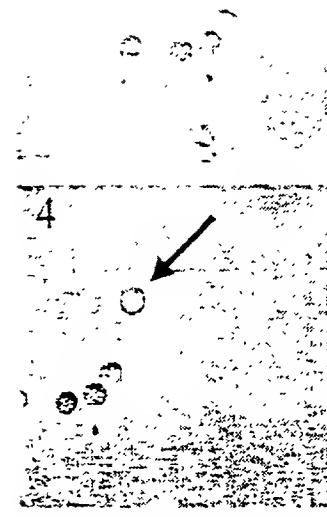
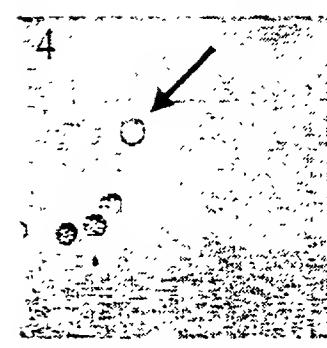


Fig. 3c 3



4

Fig. 3d



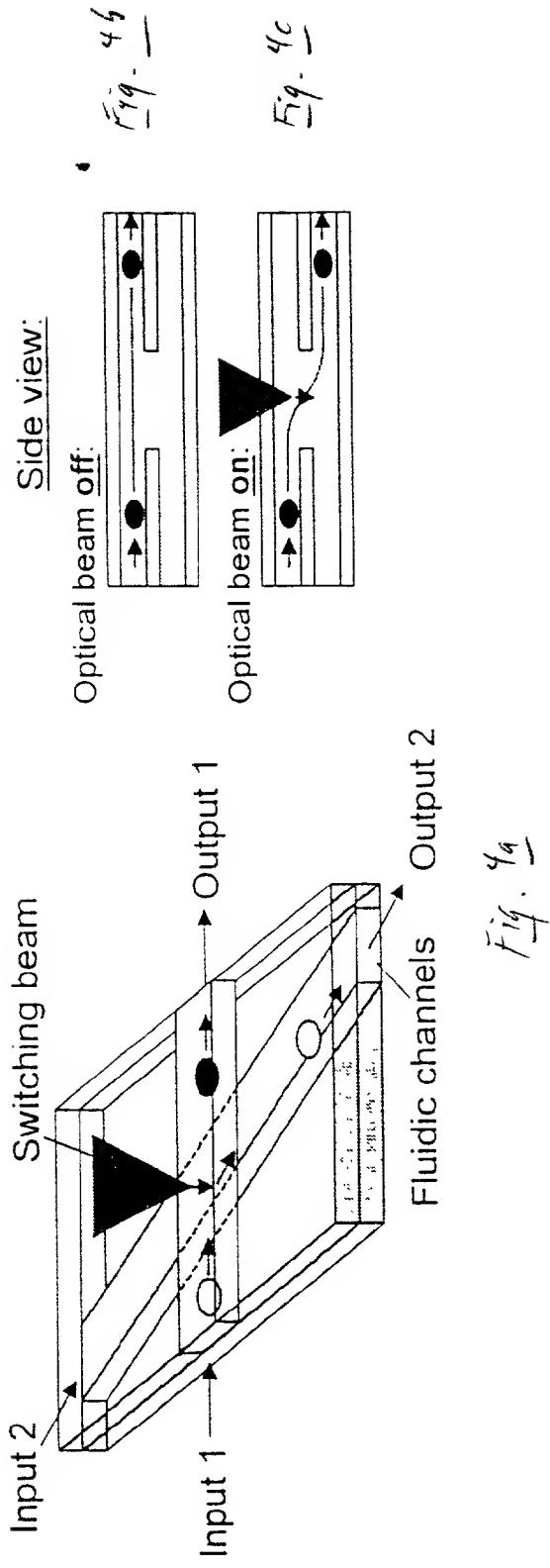
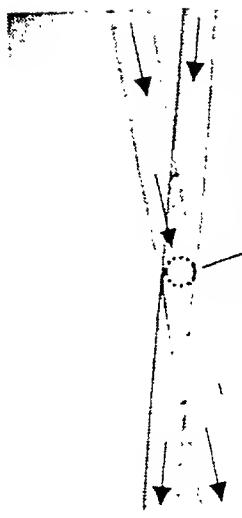


Fig. 4a



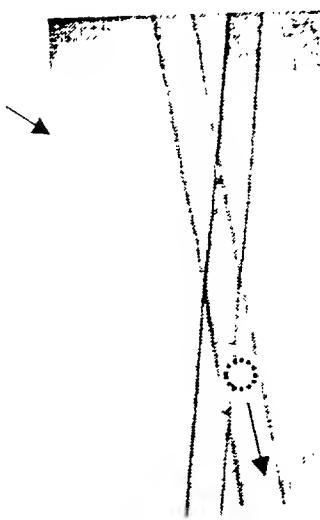
Fig. 4c

Wen, et al., "Optical trap for micro-manipulation of living cells using a single beam," *J. Biomed. Opt.*, 10(2), 199-206 (2005).



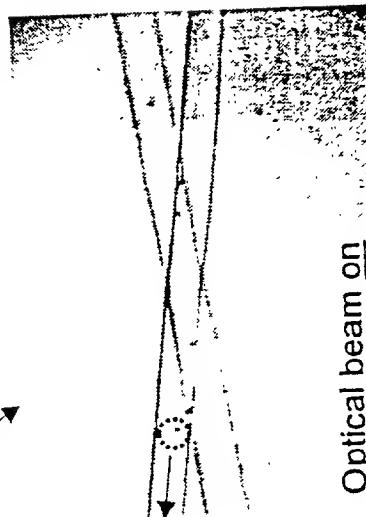
Particle at intersection

Fig. 5a



Optical beam off

Fig. 5b



Optical beam on

Fig. 5c

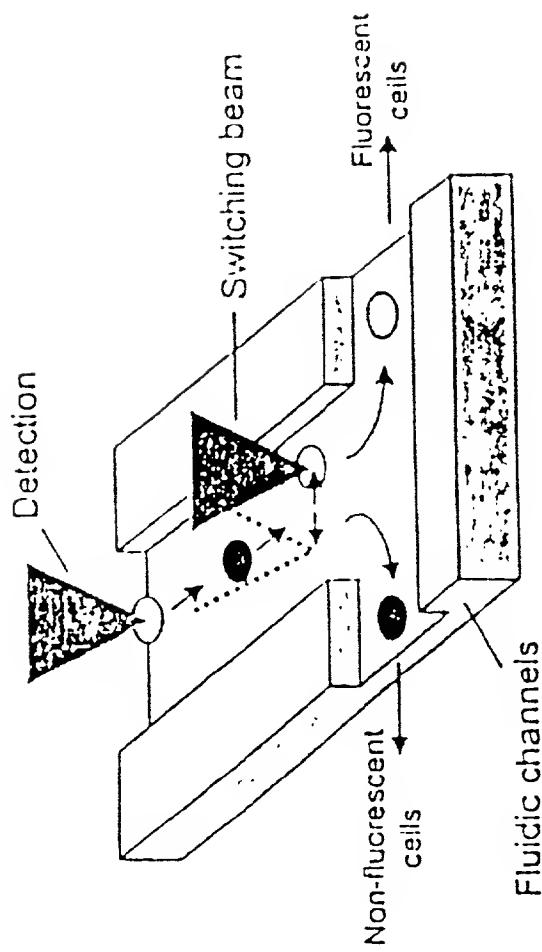


Fig 6

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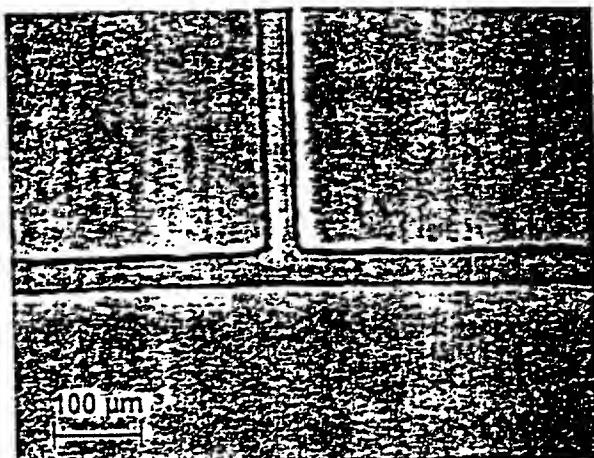


Fig. 79

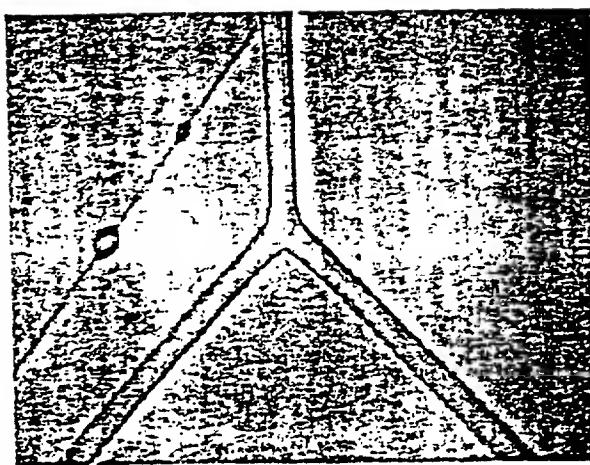


Fig. 75

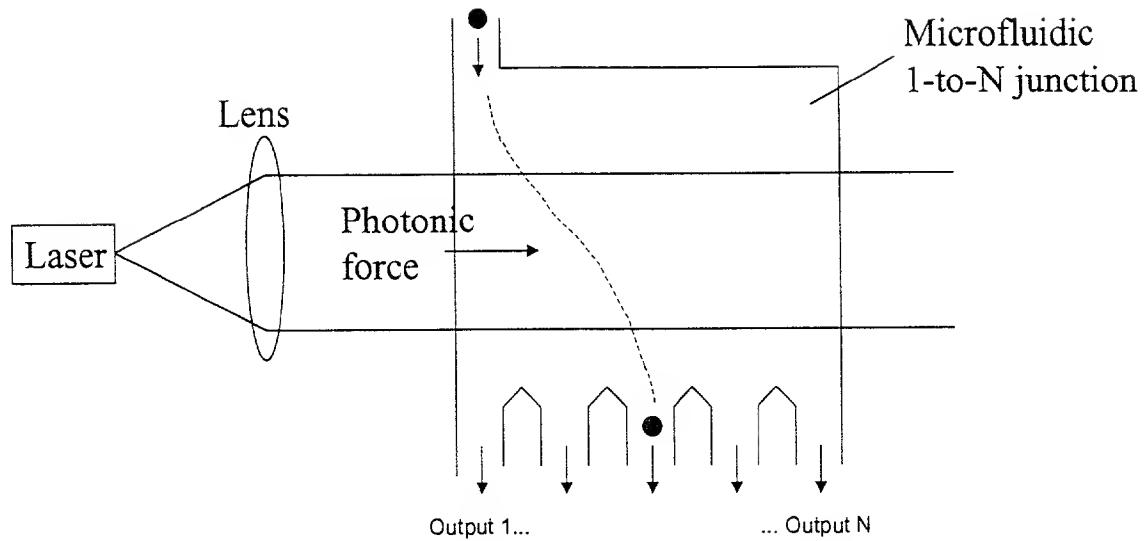


Figure 7c 1-to-N optically-switched microfluidic junction

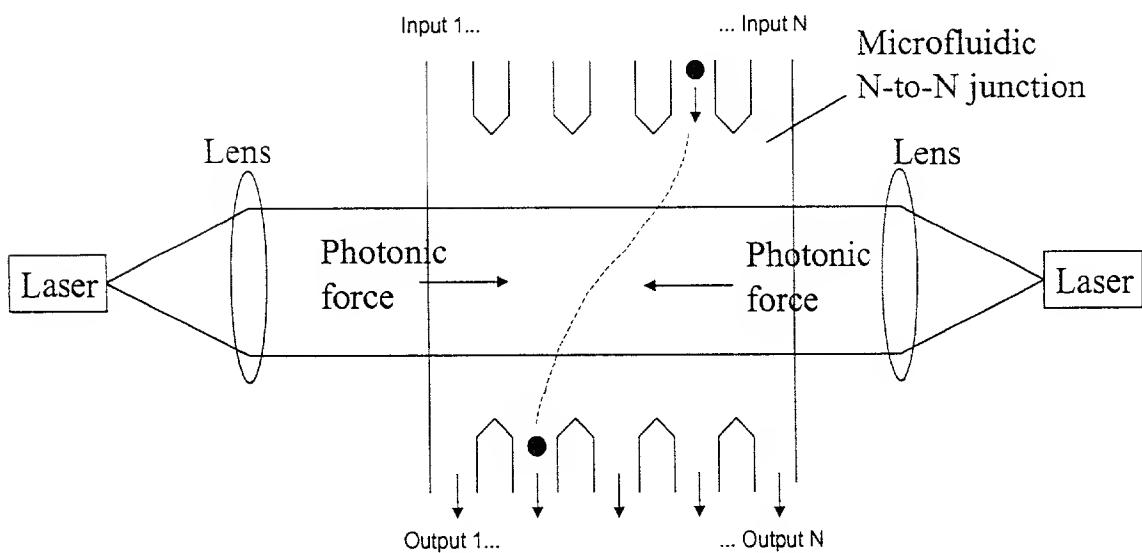
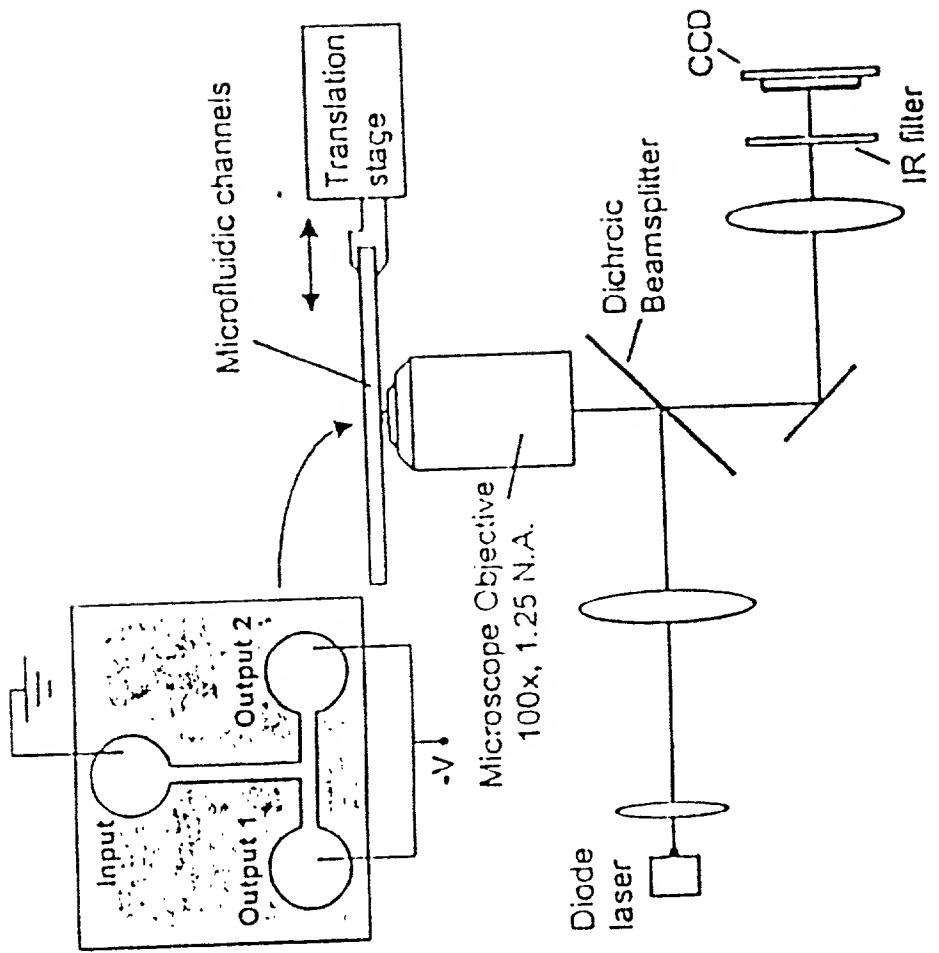


Figure 7d N-to-N optically-switched microfluidic junction

Fig. 8



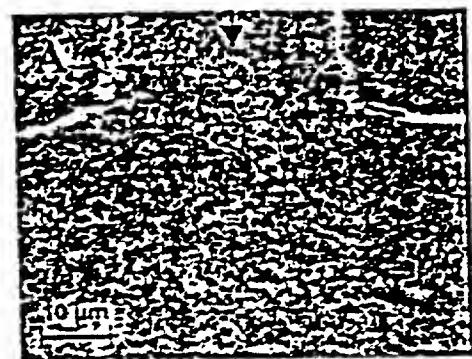


Fig. 9a

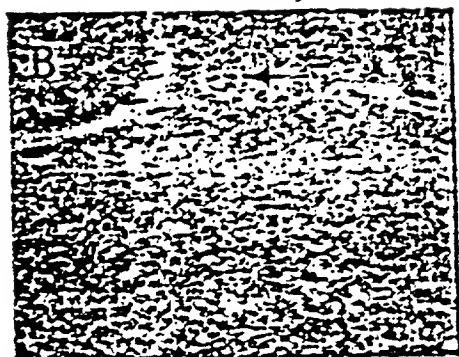


Fig. 9b

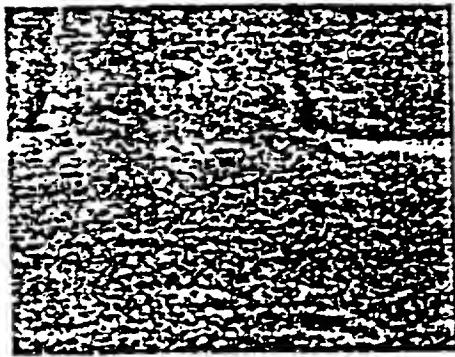


Fig. 9d

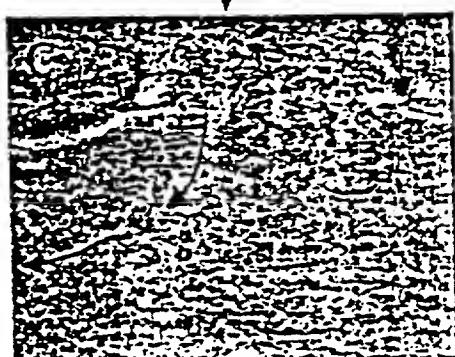


Fig. 9c

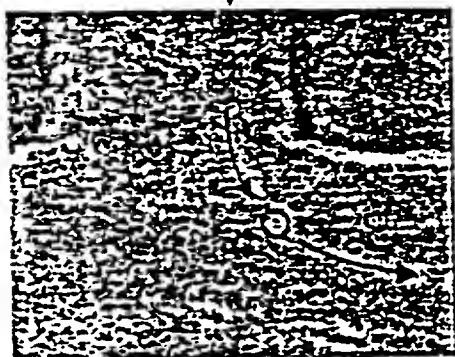


Fig. 9e